

CLAIMS TO INVENTION:

33. A planar light illumination module (PLIM) of compact construction for producing a planar laser illumination beam (PLIB) which emanates substantially within a single plane along the direction of beam propagation towards an object to be optically illuminated, said PLIM comprising:

a module housing having an axial extent, first and second end portions, a central bore formed along said axial extent, and a wedge-like recess integrally formed in said second end portion;

a visible laser diode (VLD) mounted along said bore at said first end portion of said module housing, for producing a laser beam generally along said axial extent;

a focusing lens mounted along said bore between said first and second end portions, for focusing said laser beam to a predetermined focal point; and

a laser beam expansion element mounted within said wedge-like recess at said second end portion of said module housing, and expanding said laser beam along a predetermined direction and producing a substantially planar laser illumination beam from said beam expansion component.

34. The PLIM of claim 32, wherein said beam expansion component comprises a cylindrical lens element mounted within said wedge-like recess.

35. The PLIM of claim 32, wherein said focusing element is micro-oscillated so that said planar laser illumination beam is micro-oscillated laterally along its planar extent.

36. The PLIIM of Claim 33, wherein said recess has a wedge-like geometry.

37. In a PLIIM system, a planar laser illumination module (PLIM), said PLIM comprising:

a laser diode for producing a laser beam;

a focusing lens for focusing said laser beam to its minimum beam width at a point which is the farthest distance at which said PLIIM based system is designed to capture images, and

a cylindrical lens element for expanding (i.e. spreading out) said laser beam along the direction of beam propagation so that a substantially planar laser illumination beam (PLIB) is produced, which is characterized by a plane of propagation that is coplanar with the direction of beam propagation.